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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WITKOWSKI, ALEXANDER C

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,896	Applicant(s) HACK ET AL.	
	Examiner ALEXANDER C. WITKOWSKI	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/31/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 - 4, 7, 8, 10, 11, 12, 13 - 16, 19, 20, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Courian et al. (US 6,527,370).

With respect to claim 1, Courian et al. teaches **an inkjet print head** (Fig.1: 80) **comprising at least one nozzle chamber** (Fig.2: 160), **having a nozzle aperture** (Fig.1: 104) **defined in one wall thereof for the ejection of printing fluid out of said aperture, and a printing fluid supply channel** (Fig.1: 54) **interconnected with said nozzle chamber** (Fig.2: 160), **characterized in that it further comprises a printing fluid droplet tail release guide arrangement** (col.13, lines 1-6: disclosing counter-bore [nozzle aperture] on the top surface [one wall of nozzle chamber] of the orifice-plate member) **having a predetermined position at an edge of a circumference of said aperture** (col.13, lines 1-6: disclosing that a counter-bore on the top surface of the orifice-plate member [predetermined position at an edge of a circumference of the aperture] control tail break-off of expelled ink-jet droplets).

With respect to claim 2, Courian et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a pointed burr like element the point of which is directed inwards of said aperture** (Fig.13: showing tail break-off location [printing fluid droplet tail release guide arrangement] with bottom wall [pointed burr like element whose point is directed inwards] 276; see col.45, lines 5-13: disclosing that laser-ablated bore holes have burrs on the exit-side edge [a pointed burr like element the point of which is directed inwards of said aperture])).

With respect to claim 3, Courian et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a bar of essentially triangular cross-section** (col.8, lines 32-37: disclosing triangular recess with the upper end of the recess is at the top surface of the orifice plate) **a base of which rests on an inner surface of said nozzle chamber** (Fig.2: 160) **and a pointed edge of which protrudes towards the center of said aperture** (Fig.1: 104) **said bar further extending along said inner surface inwards** (Fig.17: 420) **of said nozzle chamber.**

With respect to claim 4, Courian et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a pointed structure of essentially pyramidal shape** (col.8, line 36) **a base of which rests on an inner surface wall of said nozzle chamber** (Fig.2: 160) **and a pointed tip of which protrudes towards the center** (col.42, lines 51-65) **of said aperture** (Fig.1: 104).

With respect to claim 7, Courian et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a recessed section of essentially triangular shape in an inner surface wall** (Fig.14; col.43, lines 36-39: disclosing triangular counter-bore) **of said nozzle chamber** (Fig.2: 160) **a base of which rests in the plane of said aperture** (Fig.1: 104) **and a point of which is directed inwards** (col.42, lines 51-65) **of said nozzle chamber.**

With respect to claim 8, Courian et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a recessed section of essentially triangular pyramidal shape in an inner surface wall** (Fig.14; col.43, lines 36-39: disclosing triangular / pyramidal counter-bore) **of said nozzle chamber** (Fig.2: 160) **a base of which rests in the plane of said aperture** (Fig.1: 104) **and a point of which is directed inwards** (col.42, lines 51-65) **of said nozzle chamber.**

With respect to claim 10, Courian et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a recessed section of essentially rectangular shape** (Fig.14; col.43, lines 36-39: disclosing square / rectangular counter-bore) **extending from said aperture** (Fig.1: 104) **inwards along an inner surface wall of said nozzle chamber** (col.43, lines 36-39).

With respect to claim 11, Courian et al. teaches **a print cartridge body** (claim 9), **a fluid reservoir** (claim 9) **and is characterized in that it further comprises an inkjet**

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print head (Fig.1: 80) according to claim 1.

With respect to claim 12, Courian et al. teaches an **inkjet printing device** (Fig.21), **characterized in that it comprises an inkjet print head (Fig.1: 80) according to claim 1.**

Method claims 13 - 16, 19, 20, and 22 recite the same limitations of 102 rejected claims 1 - 4, 7, 8, and 10. Therefore, claims 13 - 16, 19, 20, and 22 are also rejected for the same reasons.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5, 6, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Courian et al. (US 6,527,370) in view of Weber et al. (6,527,369).

With respect to claim 5, Courian et al. teaches all the limitations of claim 1 above.

However, Courian et al. does not teach **that said printing fluid droplet tail release guide arrangement comprises a pointed burr like element the point of which is directed outwards of an aperture.**

Weber et al. teaches **that said printing fluid droplet tail release guide arrangement comprises a pointed burr like element the point of which is directed outwards** (Weber et al.: Fig.10: showing cusped orifice directed outwards) **of an aperture** (Fig.10: 1003).

It would have been obvious to one of ordinary skill in the art at the time this invention was made to modify Courian et al. to have a nozzle with a pointed burr like element the point of which is directed outwards of an aperture as taught by Weber et al. because such a nozzle would cause the printing fluid droplet tail to be severed at a predictable location from the orifice (Abstract: lines 1-4).

With respect to claim 6, Courian et al. teaches all the limitations of claim 1 above.

However, Courian et al. does not teach **that said printing fluid droplet tail release guide arrangement comprises an essentially saw tooth shaped section arranged at a portion of said edge of said circumference of an aperture.**

Weber et al. teaches **that said printing fluid droplet tail release guide arrangement comprises an essentially saw tooth shaped section arranged at a portion of said edge of said circumference** (Weber et al.: Fig.11: showing multiple-cusp orifice) **of an aperture** (Fig.11: 1103).

It would have been obvious to one of ordinary skill in the art at the time this invention was made to modify Courian et al. to have a nozzle with an essentially saw tooth shaped section arranged at a portion of said edge of said circumference of an aperture as taught by Weber et al. because such a nozzle results in improved edge roughness and improved quality of print (Abstract: lines 1-4).

Method claims 17 and 18 recite the same limitations of 103 rejected claims 5 and 6. Therefore, claims 17 and 18 are also rejected for the same reasons.

5. Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Courian et al. (US 6,527,370) in view of Umehara (US 6,878,298).

With respect to claim 9, Courian et al. teaches all the limitations of claim 1 above.

However, Courian et al. does not teach **that said printing fluid droplet tail release guide arrangement comprises a recessed section of essentially hemispherical shape in an inner surface wall of a nozzle chamber a chord of which rests in the plane of an aperture and an arc of which extend inwards of a nozzle chamber.**

Umehara teaches **that said printing fluid droplet tail release guide arrangement comprises a recessed section of essentially hemispherical shape in an inner surface wall of a nozzle chamber** (Umehara: Fig.3: 33, 37, 41) **a chord of**

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which rests in the plane of an aperture (Umehara: 33, 37, 41) and an arc of which extend inwards (Umehara: Fig.4: 33a, 33b) of a nozzle chamber.

It would have been obvious to one of ordinary skill in the art at the time this invention was made to modify Courian et al. to have a nozzle with a recessed section of essentially hemispherical shape in an inner surface wall of a nozzle chamber a chord of which rests in the plane of an aperture and an arc of which extend inwards of a nozzle chamber as taught by Umehara because such a nozzle results in a pressure generating cavity that prevents stagnation of ink flow and formation of vapor bubbles (col.16, lines 64-66).

Method claim 21 recites the same limitations of 103 rejected claim 9. Therefore, claim 21 is also rejected for the same reasons.

Response to Arguments

a. Applicants argue that, regarding claim 1, the Examiner asserted that Courian teaches an inkjet print head comprising at least one nozzle chamber, having a nozzle aperture defined in one wall thereof for the ejection of printing fluid out of said aperture, and printing fluid supply channel interconnected with said nozzle chamber, and the inkjet print head further comprises a printing fluid droplet tail release guide arrangement having a predetermined position at an edge of a circumference of said aperture. However, Applicants respectfully disagree with such erroneous assertion. More specifically, Courian discloses a counter-bore, which is in fluid communication with the ink-transfer bore. When the counter-bore is formed to be non-centric in respect to the ink-transfer bore, it can control the tail break-off expelled ink-jet droplets. That is, Courian attempts to control the droplet tail by providing a non-centric counter-bore. Therefore, Courian does NOT teach the provision of a printing fluid droplet tail release guide arrangement having a predetermined position at an edge of a circumference of the nozzle aperture as presently set forth in claim 1 of the subject application.

b. Applicants argue that, moreover, in the drawings and descriptions of Courian, the bore circumferential edge is basically not altered and it is smooth. Courian does not mention the provision of any element or recess of a specific shape at the circumferential edge of the bore. Courian's way of solving the problem of droplet tail is different from that as set forth in claim 1 of the subject application.

6. Examiner responds to Applicants' argument (a) above by noting that Courian et al. is not limited to controlling printing fluid droplet tail release with the edge of a non-concentric counter-bore nozzle. In fact, Courian et al. discloses a concentric counter-bore nozzle for tail break-off control in the Abstract. In either case, Courian et al. teaches that tail break-off occurs at an edge of the nozzle aperture.

Examiner responds to Applicants argument (b) above by respectfully reminding Applicants that Courian et al. discloses: sharp bore edges with burrs at column 45, line 10; square, triangular, oval-shaped, circular recesses, pentagonal, and "other regular or irregular shape" in bore at column 8, line 36.

Applicants' arguments filed 06/25/2008 have been fully considered but they are not persuasive.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER C. WITKOWSKI whose telephone number is (571) 270-3795. The examiner can normally be reached on Monday - Friday 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ACW

/STEPHEN D. MEIER/
Supervisory Patent Examiner, Art Unit 2853